Drug Delivery Research

Researchers at Northeastern are collaborating across disciplines to reimagine drug delivery. The combination of outside-the-box collaborations and innovative technologies to tackle health challenges results in what’s just one example of the University’s excellence in use-inspired research.

Advances in drug delivery are part of Northeastern’s mission to identify solutions to global challenges like **health**, **security**, and **sustainability**.

### Northeastern’s Leading Drug Delivery Researchers

**Mansoor Amiji**, distinguished professor and chair of the department of pharmaceutical sciences

**Research focus:** Amiji is leading interdisciplinary research into nanotechnology-based methods of drug delivery that could provide breakthroughs in treating diseases like cancer, inflammatory ailments, Alzheimer’s, schizophrenia, and HIV/AIDS.

**Recent grants:** Amiji is co-investigator on a five-year, $3.2 million Nanomedicine Science and Technology Interdisciplinary Graduate Education and Research Training (IGERT) grant from the National Science Foundation to train doctoral students; a five-year, $2.32 million grant as part of the Cancer Nanotechnology Platform Partnership program; a two-year, $475,000 grant from the National Institute of Neurological Diseases and Stroke to examine a system of delivery that will allow drugs to cross the blood-brain barrier; a two-year, $350,000 grant from the National Cancer Institute to develop more potent therapies for killing cancer cells that become resistant after initial chemotherapeutic treatment.

**Vladimir Torchilin**, distinguished professor of pharmaceutical sciences, director of the Center for Pharmaceutical Biotechnology and Nanomedicine

**Research focus:** Torchilin is looking at how drug delivery systems can be improved by pharmaceutical nanotechnology.

**Recent grants:** $13.5 million from the National Institutes of Health for the Center of Cancer Nanotechnology Excellence; a grant of $1.5 million from the National Institutes of Health for intracellular drug delivery; a $1.36 million grant from the National Institutes of Health’s Cancer Institute to examine a new, nanotechnology-based method of drug delivery.

### Recent News

Numerous grants are helping to fund health research that harnesses the power of nanotechnology. Pharmaceutical sciences professor Mansoor Amiji, for instance, is leading research into drug delivery that could revolutionize treatment of diseases like cancer, Alzheimer’s, and HIV/AIDS.

The National Institutes of Health (NIH) recently awarded so-called R21 grants to enable the work of Amiji and his collaborators from the Colleges of Science and Engineering.

A two-year, $350,000 grant from the National Cancer Institute will help fund research of nanomedicine techniques for killing cancer cells. Amiji, working with chemistry and chemical biology professors Robert Hanson and Max Diem, will explore whether including the cell killer ceramide as a part of chemotherapy will kill tumor cells that are resistant to other treatments. Using nanocarrier technology, the combination treatment would be delivered directly inside a cancer cell to trigger cell death.

A two-year, $475,000 grant from the National Institute of Neurological Diseases and Stroke was awarded to Amiji and Professor Rebecca Carrier, which will help them to examine a delivery system that will allow drugs to cross the blood-brain barrier.

The process could greatly increase the recovery chances of a patient with Parkinson’s or HIV/AIDS, Amiji said, because “having a system to get these drug therapies to their appropriate place of action is critical.”

The new system could vastly improve the treatment of those diseases that tend to “hide” in the brain, using it as a sanctuary. “If we can take the drug to where the virus is hiding, we will have better therapeutic effects,” said Amiji.
For more information about research at Northeastern, contact Tim Leshan, vice president for government relations, 617.373.8528, t.leshan@neu.edu.